Conceptual Design and Performance Analysis of Parallel Drive-Train for Hybrid Electric Motorcycle

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ABSTRACT
Increasing numbers of motorcycles are causing urban source of unregulated pollutants which are hazardous to environment and human health. Hybrid electric motorcycle (HEM) could be a solution to the problem as the electric system operates at high efficiency, allow diversification of energy resources, zero local emission and work silently. A HEM with parallel drive-train configuration has better fuel economy but post complex drive-train. In this paper, a parallel drive-train is proposed where two numbers of one way clutch are used to isolate the power source components when operating at different speed. The parallel drive-train allows the control unit to utilize and manage the power sources efficiently by operating at various modes based on the driving requirement. Meantime, maximum torque is available in blended mode when the internal combustion engine and electric motor operate simultaneously. The proposed drive-train posts the advantages of being simple, low cost and ease for control design for a HEM.

KEYWORDS: Hybrid Electric, Parallel Drive-Train

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